

What is claimed is:

1. A method to detect IgE comprising:
  - (a) contacting an isolated human  $\text{Fc}_\epsilon\text{R}$  receptor ( $\text{Fc}_\epsilon\text{R}$ ) molecule with a putative IgE-containing composition under conditions suitable for formation of a  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex, wherein said IgE is selected from the group consisting of canine IgE, feline IgE and equine IgE; and
  - (b) determining the presence of IgE by detecting said  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex, the presence of said  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex indicating the presence of IgE.
2. The method of Claim 1, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule comprises at least a portion of a  $\text{Fc}_\epsilon\text{R}$  alpha chain that binds to IgE.
3. The method of Claim 1, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule comprises a protein selected from the group consisting of  $\text{PhFc}_\epsilon\text{R}\alpha_{257}$ ,  $\text{PhFc}_\epsilon\text{R}\alpha_{197}$ ,  $\text{PhFc}_\epsilon\text{R}\alpha_{232}$  and  $\text{PhFc}_\epsilon\text{R}\alpha_{172}$ .
4. The method of Claim 1, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is encoded by a nucleic acid molecule selected from the group consisting of  $\text{nhFc}_\epsilon\text{R}\alpha_{774}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{1198}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{612}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{591}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{699}$  and  $\text{nhFc}_\epsilon\text{R}\alpha_{516}$ .
5. The method of Claim 1, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is encoded by a nucleic acid molecule selected from the group consisting of a nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:4, SEQ ID NO:7, SEQ ID NO:10 and SEQ ID NO:12, and a nucleic acid molecule comprising an allelic variant of a nucleic acid molecule comprising any of said nucleic acid sequences.

6. The method of Claim 1, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is conjugated to a detectable marker.
7. The method of Claim 1, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is conjugated to a detectable marker selected from the group consisting of a radioactive label, a fluorescent label, a chemiluminescent label, a chromophoric label and a ligand.
8. The method of Claim 1, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is conjugated to a detectable marker selected from the group consisting of fluorescein, a radioisotope, a phosphatase, biotin, biotin-related compounds, avidin, avidin-related compounds and a peroxidase.
9. The method of Claim 1, wherein a carbohydrate group of said  $\text{Fc}_\epsilon\text{R}$  molecule is conjugated to biotin.
10. The method of Claim 1, wherein said putative IgE-containing composition comprises a composition selected from the group consisting of blood, serum, plasma, urine, tears, aqueous humor, central nervous system fluid (CSF), saliva, lymph, nasal secretions, milk and feces.
11. The method of Claim 1, wherein said putative IgE-containing composition comprises serum.
12. The method of Claim 1, wherein said putative IgE-containing composition comprises a cell that produces IgE.
13. The method of Claim 1, wherein said putative IgE-containing composition comprises a cell selected from the group consisting of a myeloma cell and a basophil cell.
14. The method of Claim 1 further comprising the step selected from the group consisting of binding said  $\text{Fc}_\epsilon\text{R}$  molecule to a substrate prior to performing step (a)

to form a Fc<sub>ε</sub>R molecule-coated substrate; and binding said putative IgE-containing composition to a substrate prior to performing step (a) to form a putative IgE-containing composition-coated substrate, wherein said substrate is selected from the group consisting of a non-coated substrate, a Fc<sub>ε</sub>R molecule-coated substrate, an antigen-coated substrate and an anti-IgE antibody-coated substrate.

15. The method of Claim 14, wherein said antigen is selected from the group consisting of an allergen and a parasitic antigen.

16. The method of Claim 14, further comprising removing non-bound material from said antigen-coated substrate or said antibody-coated substrate under conditions that retain antigen or antibody binding to said substrate.

17. The method of Claim 14, wherein said substrate comprises a material selected from the group consisting of plastic, glass, gel, celluloid, paper and particulate material.

18. The method of Claim 17, wherein said substrate material is selected from the group consisting of latex, polystyrene, nylon, nitrocellulose, agarose and magnetic resin.

19. The method of Claim 14, wherein said substrate comprises a shape selected from the group consisting of a well, a plate, a dipstick, a bead, a lateral flow apparatus, a membrane, a filter, a tube, a dish, a celluloid-type matrix and a magnetic particle.

20. The method of Claim 14, wherein said substrate comprises an ELISA plate, a dipstick, a radioimmunoassay plate, agarose beads, plastic beads, latex beads, immunoblot membranes and immunoblot papers.

21. The method of Claim 1, wherein said step of detecting comprises performing assays selected from the group consisting of enzyme-linked immunoassays, radioimmunoassays, immunoprecipitations, fluorescence immunoassays, chemiluminescent assay, immunoblot assays, lateral flow assays, agglutination assays and particulate-based assays.

22. The method of Claim 1, wherein said step of detecting comprises:

- (a) contacting said  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex with an indicator molecule that binds selectively to said  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex;
- (b) removing substantially all of said indicator molecule that does not selectively bind to  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex; and
- (c) detecting said indicator molecule, wherein presence of said indicator molecule is indicative of the presence of IgE.

23. The method of Claim 22, wherein said indicator molecule comprises a compound selected from the group consisting of a  $\text{Fc}_\epsilon\text{R}$  molecule, an antigen, an antibody and a lectin.

24. The method of Claim 1, said method comprising the steps of:

- (a) immobilizing said  $\text{Fc}_\epsilon\text{R}$  molecule on a substrate;
- (b) contacting said  $\text{Fc}_\epsilon\text{R}$  molecule with said putative IgE-containing composition under conditions suitable for formation of an  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex bound to said substrate;
- (c) removing non-bound material from said substrate under conditions that retain  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex binding to said substrate; and
- (d) detecting the presence of said  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex.

25. The method of Claim 24, wherein the presence of said  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex is detected by contacting said  $\text{Fc}_\epsilon\text{R}$  molecule:IgE complex with a compound selected from the group consisting of an antigen and an antibody that binds selectively to IgE.

26. The method of Claim 25, wherein said compound comprises a detectable marker.

27. The method of Claim 1, said method comprising the steps of:

- (a) immobilizing a desired antigen on a substrate;
- (b) contacting said antigen with said putative IgE-containing composition under conditions suitable for formation of an antigen:IgE complex bound to said substrate;
- (c) removing non-bound material from said substrate under conditions that retain antigen:IgE complex binding to said substrate; and
- (d) detecting the presence of said antigen:IgE complex by contacting said antigen:IgE complex with said  $\text{Fc}_\epsilon\text{R}$  molecule.

28. The method of Claim 27, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is conjugated to a detectable marker selected from the group consisting of fluorescein, a radioisotope, a phosphatase, biotin, avidin, a peroxidase and other members of the avidin-biotin family.

29. The method of Claim 1, said method comprising the steps of:

- (a) immobilizing an antibody that binds selectively to IgE on a substrate;

(b) contacting said antibody with said putative IgE-containing composition under conditions suitable for formation of an antibody:IgE complex bound to said substrate;

(c) removing non-bound material from said substrate under conditions that retain antibody:IgE complex binding to said substrate; and

(d) detecting the presence of said antibody:IgE complex by contacting said antibody:IgE complex with said Fc<sub>ε</sub>R molecule.

30. The method of Claim 29, wherein said Fc<sub>ε</sub>R molecule is conjugated to a detectable marker selected from the group consisting of fluorescein, a radioisotope, a phosphatase, biotin, a biotin-related compound, avidin, an avidin-related compound and a peroxidase.

31. The method of Claim 1, said method comprising the steps of:

(a) immobilizing said putative IgE-containing composition on a substrate;

(b) contacting said composition with said Fc<sub>ε</sub>R molecule under conditions suitable for formation of an Fc<sub>ε</sub>R molecule:IgE complex bound to said substrate;

(c) removing non-bound material from said substrate under conditions that retain Fc<sub>ε</sub>R molecule:IgE complex binding to said substrate; and

(d) detecting the presence of said Fc<sub>ε</sub>R molecule:IgE complex.

32. The method of Claim 31, wherein the presence of said Fc<sub>ε</sub>R molecule:IgE complex is detected by contacting said Fc<sub>ε</sub>R molecule:IgE complex with an indicator molecule selected from the group consisting of an antibody, an antigen and a lectin.

33. The method of Claim 31, wherein said Fc<sub>ε</sub>R molecule comprises a detectable marker.
34. The method of Claim 1, wherein said putative IgE-containing composition is obtained from an animal, wherein said animal is selected from the group consisting of a dog and a cat.
35. The method of Claim 1, wherein said method is performed in solution.

36. A method to detect IgE comprising:

(a) contacting a recombinant cell with a putative IgE-containing composition under conditions suitable for formation of a recombinant cell:IgE complex, wherein said recombinant cell is selected from the group consisting of: a recombinant cell expressing a human  $Fc_{\epsilon}R$  molecule; and a recombinant cell expressing an antibody that binds selectively to an IgE selected from the group consisting of canine IgE, feline IgE and equine IgE; and

(b) determining the presence of IgE by detecting said recombinant cell:IgE complex, the presence of said recombinant cell:IgE complex indicating the presence of IgE.

37. The method of Claim 36, wherein said recombinant cell expresses a  $Fc_{\epsilon}R$  molecule comprising at least a portion of a human  $Fc_{\epsilon}R$  alpha chain that binds to IgE.

38. The method of Claim 36, wherein said recombinant cell expresses a  $Fc_{\epsilon}R$  molecule comprising a protein selected from the group consisting of  $PhFc_{\epsilon}R\alpha_{257}$  and  $PhFc_{\epsilon}R\alpha_{232}$ .

39. The method of Claim 36, wherein said recombinant cell expresses a  $Fc_{\epsilon}R$  molecule encoded by a nucleic acid molecule selected from the group consisting of  $nhFc_{\epsilon}R\alpha_{612}$ ,  $nhFc_{\epsilon}R\alpha_{591}$ ,  $nhFc_{\epsilon}R\alpha_{699}$  and  $nhFc_{\epsilon}R\alpha_{516}$ .

40. The method of Claim 36, wherein said recombinant cell expresses a  $Fc_{\epsilon}R$  molecule encoded by a nucleic acid molecule selected from the group consisting of a nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:1 and SEQ ID NO:4, and a nucleic acid molecule comprising an allelic variant of a nucleic acid molecule comprising SEQ ID NO:1 and SEQ ID NO:4.



41. The method of Claim 36, wherein said recombinant cell is a RBL-hFc<sub>ε</sub>R cell.

42. A kit for detecting IgE comprising a human  $Fc_\epsilon R$  molecule and a means for detecting an IgE selected from the group consisting of canine IgE, feline IgE and equine IgE.

43. The kit of Claim 42, wherein said detection means further comprises an antigen selected from the group consisting of an allergen and a parasite antigen, wherein said antigen induces IgE antibody production in animals selected from the group consisting of canines, felines and equines.

44. The kit of Claim 42, wherein said detection means comprises an antibody that selectively binds to an IgE.

45. The kit of Claim 42, wherein said detection means detects said  $Fc_\epsilon R$  molecule.

46. The kit of Claim 42, wherein said  $Fc_\epsilon R$  molecule is conjugated to biotin.

47. The kit of Claim 42, wherein said  $Fc_\epsilon R$  molecule is on the surface of a recombinant cell that expresses said  $Fc_\epsilon R$  molecule.

48. The kit of Claim 43, wherein said antigen is immobilized on a substrate.

49. The kit of Claim 48, wherein said substrate comprises a material selected from the group consisting of plastic, glass, gel, celluloid, paper, magnetic resin, polyvinylidene-fluoride, nylon, nitrocellulose and particulate material.

50. The kit of Claim 48, wherein said substrate material is selected from the group consisting of latex, polystyrene, nylon, nitrocellulose, agarose and magnetic resin.

51. The kit of Claim 48, wherein said substrate comprises a shape selected from the group consisting of a well, a plate, a dipstick, a bead, a lateral flow apparatus, a membrane, a filter, a tube, a dish, a celluloid-type matrix and a magnetic particle.

52. The kit of Claim 48, wherein said substrate comprises an ELISA plate, a dipstick, a radioimmunoassay plate, agarose beads, plastic beads, latex beads, immunoblot membranes and immunoblot papers.

53. The kit of Claim 48, wherein said substrate is latex beads.

54. The kit of Claim 42, wherein said  $Fc_{\epsilon}R$  molecule comprises at least a portion of a  $Fc_{\epsilon}R$  alpha chain that binds to IgE.

55. The kit of Claim 42, wherein said  $Fc_{\epsilon}R$  molecule comprises a protein selected from the group consisting of  $PhFc_{\epsilon}R\alpha_{257}$ ,  $PhFc_{\epsilon}R\alpha_{197}$ ,  $PhFc_{\epsilon}R\alpha_{232}$  and  $PhFc_{\epsilon}R\alpha_{172}$ .

56. The kit of Claim 42, wherein said  $Fc_{\epsilon}R$  molecule is encoded by a nucleic acid molecule selected from the group consisting of  $nhFc_{\epsilon}R\alpha_{774}$ ,  $nhFc_{\epsilon}R\alpha_{1198}$ ,  $nhFc_{\epsilon}R\alpha_{612}$ ,  $nhFc_{\epsilon}R\alpha_{591}$ ,  $nhFc_{\epsilon}R\alpha_{699}$  and  $nhFc_{\epsilon}R\alpha_{516}$ .

57. The kit of Claim 42, wherein said  $Fc_{\epsilon}R$  molecule is encoded by a nucleic acid molecule selected from the group consisting of a nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:4, SEQ ID NO:7, SEQ ID NO:10 and SEQ ID NO:12, and a nucleic acid molecule comprising an allelic variant of a nucleic acid molecule comprising any of said nucleic acid sequences.

58. The kit of Claim 42, wherein said  $Fc_{\epsilon}R$  molecule is conjugated to a detectable marker.

59. The kit of Claim 42, wherein said  $Fc_{\epsilon}R$  molecule is conjugated to a detectable marker selected from the group consisting of a radioactive label, a fluorescent label, a chemiluminescent label, a chromophoric label and a ligand.

60. The kit of Claim 42, wherein said  $Fc_eR$  molecule is conjugated to a detectable marker selected from the group consisting of fluorescein, a radioisotope, a phosphatase, biotin, a biotin-related compound, avidin, an avidin-related compound and a peroxidase.

61. The kit of Claim 42, wherein a carbohydrate group of said  $Fc_eR$  molecule is conjugated to biotin.

62. The kit of Claim 43, wherein said allergen is derived from material selected from the group consisting of fungi, trees, weeds, shrubs, grasses, wheat, corn, soybean, rice, eggs, milk, cheese, bovine, poultry, swine, sheep, yeast, fleas, flies, mosquitos, mites, midges, biting gnats, lice, bees, wasps, ants, true bugs and ticks.

63. The kit of Claim 62, wherein said flea allergen is a flea saliva antigen.

64. The kit of Claim 42, wherein said parasite antigen is a heartworm antigen.

65. The kit of Claim 42 further comprising an apparatus comprising:

(a) a support structure defining a flow path;

(b) a labeling reagent comprising a bead conjugated to said antigen,

wherein said labeling reagent is impregnated within the support structure in a labeling zone; and

(c) a capture reagent comprising said  $Fc_eR$  molecule, wherein said capture reagent is located downstream of said labeling reagent within a capture zone fluidly connected to said labeling zone in such a manner that said labeling reagent can flow from said labeling zone into said capture zone.

66. The kit of Claim 65, wherein said apparatus further comprises a sample receiving zone located along said flow path.

67. The kit of Claim 65, wherein said apparatus further comprises an absorbent located at the end of said flow path.
68. The kit of Claim 66, wherein said sample receiving zone is located upstream of said labeling reagent.
69. The kit of Claim 65, wherein said support structure comprises a material that does not impede the flow of said bead from said labeling zone to said capture zone.
70. The kit of Claim 65, wherein said support structure comprises an ionic material.
71. The kit of Claim 65, wherein said support structure comprises a material selected from the group consisting of nitrocellulose, PVDF and carboxymethylcellulose.
72. The kit of Claim 65, wherein said bead comprises a latex bead.
73. The kit of Claim 65, wherein said labeling reagent is dried within said labeling zone and said capture reagent is dried within said capture zone.

74. A general allergen kit comprising an allergen common to all regions of the United States and a human  $Fc_{\epsilon}$  receptor ( $Fc_{\epsilon}R$ ) molecule.

75. The kit of Claim 74, wherein said allergen is selected from the group consisting of grass, Meadow Fescue, Curly Dock, plantain, Mexican Firebush, Lamb's Quarters, pigweed, ragweed, sage, elm, cocklebur, Box Elder, walnut, cottonwood, ash, birch, cedar, oak, mulberry, cockroach, *Dermataphagoides*, *Alternaria*, *Aspergillus*, *Cladosporium*, *Fusarium*, *Helminthosporium*, *Mucor*, *Penicillium*, *Pullularia*, *Rhizopus* and *Tricophyton*.

76. The kit of Claim 74, wherein said allergen is selected from the group consisting of Johnson Grass, Kentucky Blue Grass, Meadow Fescue, Orchard Grass, Perennial Rye Grass, Redtop Grass, Timothy Grass, Bermuda Grass, Brome Grass, Curly Dock, English Plantain, Mexican Firebush, Lamb's Quarters, Rough Pigweed Short Ragweed, Wormwood Sage, American Elm, Common Cocklebur, Box Elder, Black Walnut, Eastern Cottonwood, Green Ash, River Birch, Red Cedar, Red Oak, Red Mulberry, Cockroach, *Dermataphagoides farinae*, *Alternaria alternata*, *Aspergillus fumigatus*, *Cladosporium herbarum*, *Fusarium vasinfectum*, *Helminthosporium sativum*, *Mucor recemosus*, *Penicillium notatum*, *Pullularia pullulans*, *Rhizopus nigricans* and *Tricophyton* spp.

77. The kit of Claim 74, wherein said kit comprises one or more compositions, each composition comprising one allergen.

78. The kit of Claim 74, wherein allergen is immobilized to said substrate.

79. The kit of Claim 74, wherein said substrate is selected from the group consisting of an ELISA plate, a dipstick, a radioimmunoassay plate, agarose beads, plastic beads, immunoblot membranes and immunoblot papers.

80. The kit of Claim 74, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule comprises at least a portion of an alpha chain that binds to IgE.

81. The kit of Claim 74, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule comprises a protein selected from the group consisting of  $\text{PhFc}_\epsilon\text{R}\alpha_{257}$ ,  $\text{PhFc}_\epsilon\text{R}\alpha_{197}$ ,  $\text{PhFc}_\epsilon\text{R}\alpha_{232}$  and  $\text{PhFc}_\epsilon\text{R}\alpha_{172}$ .

82. The kit of Claim 74, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is encoded by a nucleic acid molecule selected from the group consisting of  $\text{nhFc}_\epsilon\text{R}\alpha_{774}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{1198}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{612}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{591}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{699}$  and  $\text{nhFc}_\epsilon\text{R}\alpha_{516}$ .

83. The kit of Claim 74, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is encoded by a nucleic acid molecule selected from the group consisting of a nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:4, SEQ ID NO:7, SEQ ID NO:10 and SEQ ID NO:12, and a nucleic acid molecule comprising an allelic variant of a nucleic acid molecule comprising any of said nucleic acid sequences.

84. The kit of Claim 74, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is conjugated to a detectable marker.

85. The kit of Claim 74, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is conjugated to a radioactive label, a fluorescent label, a chemiluminescent label, a chromophoric label and a ligand.

86. The kit of Claim 74, wherein said  $Fc_eR$  molecule is conjugated to a detectable marker selected from the group consisting of fluorescein, a radioisotope, a phosphatase, biotin, a biotin-related compound, avidin, an avidin-related compound and a peroxidase.

87. The kit of Claim 74, wherein a carbohydrate group of said  $Fc_eR$  molecule is conjugated to biotin.



88. A method to detect flea allergy dermatitis comprising:
- (a) immobilizing a flea allergen on a substrate;
  - (b) contacting said flea allergen with a putative IgE-containing composition under conditions suitable for formation of an antigen:IgE complex bound to said substrate;
  - (c) removing non-bound material from said substrate under conditions that retain antigen:IgE complex binding to said substrate; and
  - (d) detecting the presence of said antigen:IgE complex by contacting said antigen:IgE complex with a  $\text{Fc}_\epsilon\text{R}$  molecule.
89. The method of Claim 88, wherein said flea allergen is a flea saliva antigen.
90. The method of Claim 88, wherein said flea allergen is selected from the group consisting of flea saliva products and flea saliva proteins.
91. The method of Claim 88, wherein said putative IgE-containing composition comprises an animal fluid selected from the group consisting of serum, plasma and blood.
92. The method of Claim 91, wherein said animal is selected from the group consisting of a dog and a cat.
93. The method of Claim 88, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule comprises at least a portion of a  $\text{Fc}_\epsilon\text{R}$  alpha chain that binds to IgE.

94. A kit for detecting flea allergy dermatitis comprising a human  $\text{Fc}_\epsilon\text{R}$  receptor ( $\text{Fc}_\epsilon\text{R}$ ) molecule and a flea allergen.
95. The kit of Claim 94, wherein flea allergen is selected from the group consisting of a flea saliva product and a flea saliva protein.
96. The kit of Claim 94, wherein said flea allergen comprises flea saliva products.
97. The kit of Claim 94, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is conjugated to a detectable marker.
98. The kit of Claim 94, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule is conjugated to biotin.
99. The kit of Claim 94, wherein said  $\text{Fc}_\epsilon\text{R}$  molecule comprises at least a portion of a  $\text{Fc}_\epsilon\text{R}$  alpha chain that binds to IgE.
100. The kit of Claim 99, wherein said  $\text{Fc}_\epsilon\text{R}$  alpha chain is conjugated to biotin.

101. An isolated human  $\text{Fc}_\epsilon\text{R}$  receptor ( $\text{Fc}_\epsilon\text{R}$ ) alpha chain protein, wherein a carbohydrate group of said  $\text{Fc}_\epsilon\text{R}$  alpha chain protein is conjugated to biotin.

102. The  $\text{Fc}_\epsilon\text{R}$  alpha chain protein of Claim 101, wherein said  $\text{Fc}_\epsilon\text{R}$  alpha chain protein comprises a protein selected from the group consisting of  $\text{PhFc}_\epsilon\text{R}\alpha_{257}$ ,  $\text{PhFc}_\epsilon\text{R}\alpha_{197}$ ,  $\text{PhFc}_\epsilon\text{R}\alpha_{232}$  and  $\text{PhFc}_\epsilon\text{R}\alpha_{172}$ .

103. The  $\text{Fc}_\epsilon\text{R}$  alpha chain protein of Claim 101, wherein said  $\text{Fc}_\epsilon\text{R}$  alpha chain protein is encoded by a nucleic acid molecule selected from the group consisting of  $\text{nhFc}_\epsilon\text{R}\alpha_{774}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{1198}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{612}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{591}$ ,  $\text{nhFc}_\epsilon\text{R}\alpha_{699}$  and  $\text{nhFc}_\epsilon\text{R}\alpha_{516}$ .

104. The  $\text{Fc}_\epsilon\text{R}$  alpha chain protein of Claim 101, wherein said  $\text{Fc}_\epsilon\text{R}$  alpha chain protein is encoded by a nucleic acid molecule selected from the group consisting of a nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:4, SEQ ID NO:7, SEQ ID NO:10 and SEQ ID NO:12, and a nucleic acid molecule comprising an allelic variant of a nucleic acid molecule comprising any of said nucleic acid sequences.

105. The  $\text{Fc}_\epsilon\text{R}$  alpha chain protein of Claim 101, wherein said  $\text{Fc}_\epsilon\text{R}$  alpha chain protein comprises  $\text{PhFc}_\epsilon\text{R}\alpha_{172}$ -BIOT.